

УДК 378.4

МРНТИ 06.81.12

A.Kh. Galiyeva¹, Zh.N. Sadu¹, M.T. Kulubekov², L.A. Kazbekova³

¹Kazakh University of Economics, Finance and International Trade;

²Kostanay Engineering Economic University after M. Dulatov;

³Kyzylorda State University after Korkyt Ata

E-mail: alma_galiyeva@mail.ru, kmaksat_79@mail.ru

EDUCATION AND SCIENCE AS FACTORS OF INNOVATIVE ECONOMICS DEVELOPMENT

Abstract. This work is aimed at analysis of education and science role as a system of structure elements that form the innovative economics. The tasks are: reveal the notion of education and science, analyze its constituents and its role in operating process of innovative economics, and analyze its interconnection as structural system-forming elements. The following methods were used to implement the work: graphical analysis, methods of deduction and induction, and analysis of semantic sources. The research results showed some correlation between the education level and a degree of innovative development of economics; the features of social demand in the education field in view of market economics were revealed, and as result, the education goals in knowledge economy were determined. The results can be used for correction of the national policy in the field of education and science management. The authors have come to a conclusion that for successful forming of innovative economy it is necessary to transit from less flexible convey of practical knowledge to teaching the skills on knowledge application.

Key words: innovative economy, research universities, human capital, lifelong education.

Introduction

The contemporary economic relations inherent to post-industrial societies show the most effective forms of interaction between economic agents. The most effective means such forms when goods or services have higher added values in comparison with the analogues, high level of nominal GDP and PPP around the world. Among the features inherent to the post-industrial economy are the following: large share of service sector under developed industrial sector; however, the main economic growth is reached namely due to services sector. Manufacture in this case is mainly engaged in servicing of more advanced fields. One of the forms of post-industrial economics development is innovative economics in which the main growth is not focused on service sector only, but on the service sector interacting with information and knowledge. In different time periods, the researches related to the information, knowledge and its generation were conducted by various scientists, such as Ch. Landry, R. Florida, B.P. Simonov, D.A. Ruban, F. McKinley and other. All researches were focused on the features of human capital forming as the main source of innovation in the society. This work will mainly describe the issues of education and science influence as processes and systems of institutes and enterprises on forming of innovative economics.

Main body

Education is a comprehensive notion uniting several quite different elements each of which is responsible for its part of the social life. According to Ushakov Dictionary, education is a process of knowledge acquisition, learning, and enlightenment [1]. In its turn, the process includes several

interconnected elements: system of knowledge that should be conveyed from one person to another, the process of this knowledge convey from one to another, combination of regulations and education standards, and national programs systematizing the process of knowledge convey, and combination of education organizations and social institutes encouraging the implementation of this process. The goal of education, in view of society, is training of people who have knowledge necessary to society now and in near future. Thus, the education type and its priorities are determined on the base of the social demand, and the nature of demand varies depending on political and state system, but mainly on the type of the national economy management. For the planned economy that was typical for the USSR, the social demand was less determined by the society, but more by the managing board basing on the planning indicators. For the market economy, the social demand is based more on the competitive labor market, i.e. on demand for definite knowledge and consequently salary size. In addition, definite culture codes inherent to this or that society, traditions and status of knowledge owners in the society can influence to some extent on decision what knowledge to convey, and what skills should be taught.

For all situations mentioned above the role of education in society and economics has one common feature – all these roles are reactive, i.e. responding to external stimulus. In some sort, it can be stated that education is the object of influence, not the subject.

The innovative economics as a system based on the flow of innovations, on continuing technological improvement, on manufacture and export of high technological products with high added value supposes that the main economic growth is achieved not due to manipulations with material production (as under industrial economy) and financial assets (as under post-industrial economy), but owing to manipulation with knowledge [2].

At the same time, the notion “innovation” is mentioned frequently. Innovation under this context is ability of a human to create new combinations of available knowledge and technologies capable to solve existing problems, or make the current processes more effective. So, the innovative economy is economy ensuring the growth owing to effective manipulations with available information, with further creation of new information and its practical application. Innovative economies reach competitive advantages due to qualitative, not quantitative changes in the public economy structure.

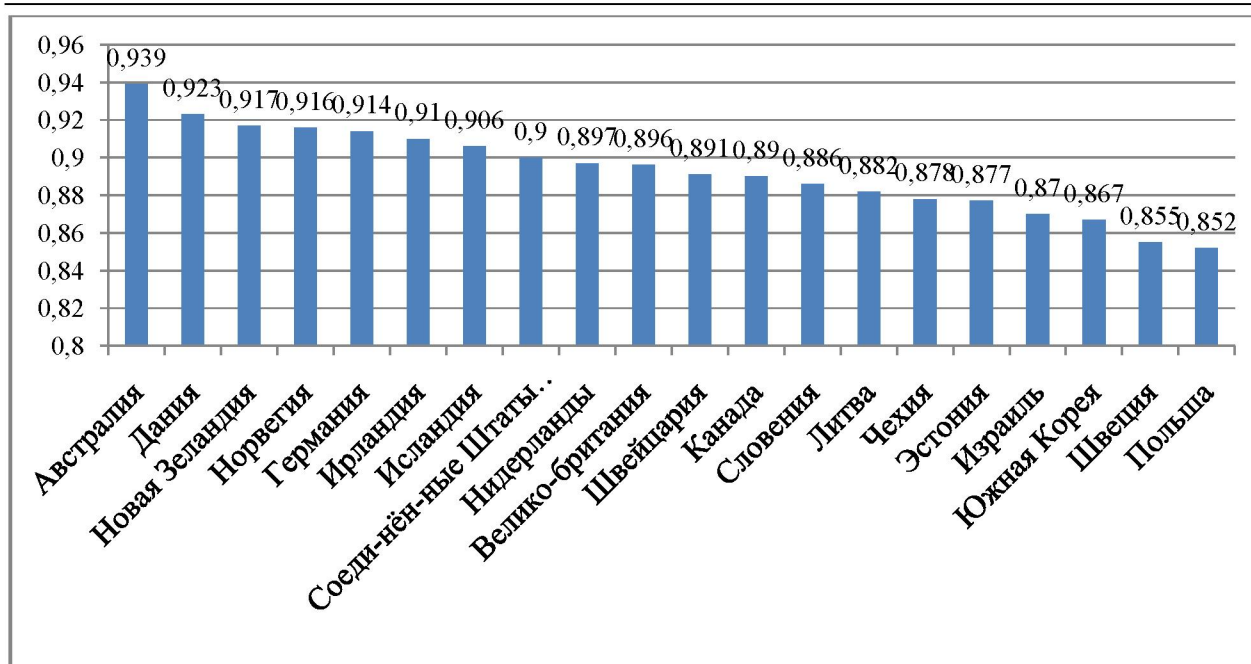
Similar to any other economy, the innovative economy needs people having necessary knowledge and skills in knowledge application. It could be said that the innovative economy forms a unique demand for skills trained under the training process in any case, but requires its formalization [3].

Education under this context as a factor of economy development does not differ much from education under the context of any other economy – it is a supplier of qualified personnel having skills corresponding to economy demand. The difference is in information dynamics of economic system.

Pre-innovative economies, in view of qualitative growth, are relatively static and stable, for instance, for a worker who wants to implement his work successfully it is enough to have a definite set of knowledge that he corrected a little and improved under renovation of productive capacities. Economic growth of an enterprise and a state in whole was reached due to increase of existing capacities, i.e. it was quantitative in its essence.

Innovative economy is informational dynamic – the structure of knowledge changes constantly, the speed of new information appearance able to influence on functioning of economic system is higher than in other economic systems, i.e. the skills gained during the learning process become out of date by the moment of practical activity start. Thus, the goal of education as a system in the innovative economy is not convey of a definite set of practical activity skills, but convey of knowledge on knowledge application that will be necessary for practical activity.

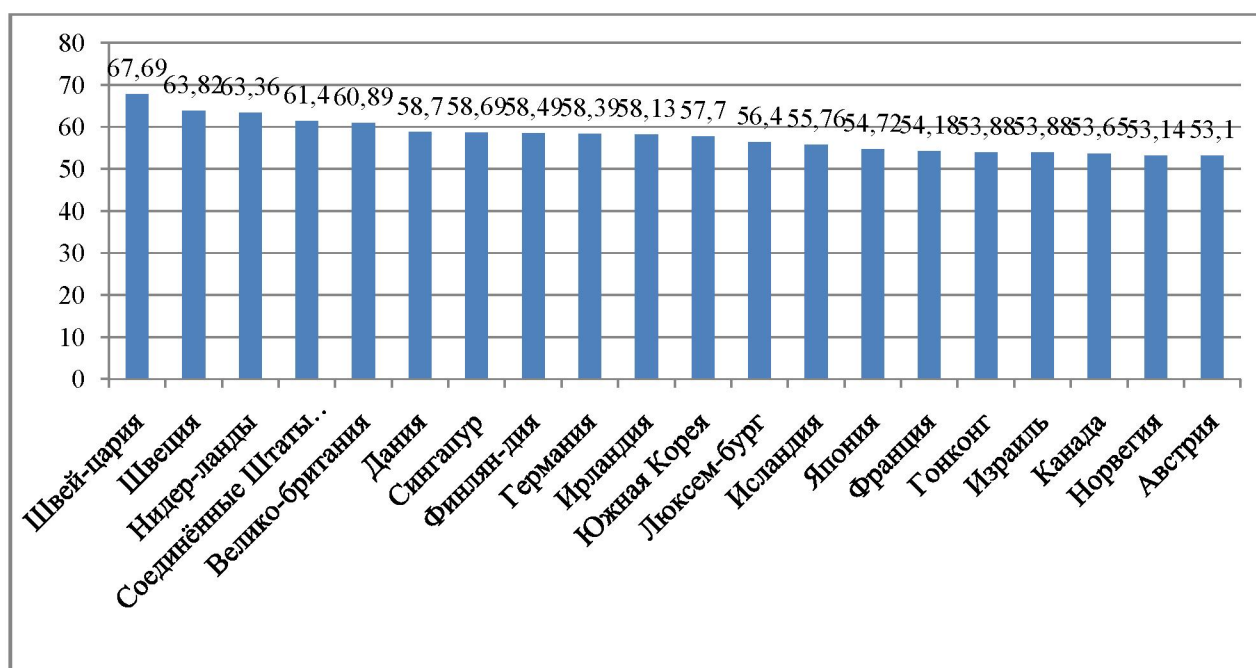
To show the interconnection of education and economic growth below is a Figure showing the education index and list of countries having the largest innovative potential.



Note – basing on reference [4]

Figure 1– Values of education global index for 20 first countries in rating

According to the global education index the most part of countries except USA, South Korea, Israel, and Canada are post-industrial European societies (Figure 1).



Note – basing on reference [5]

Figure 2 – Global index of innovations by countries

The data in Figures 1 and 2 shows that most countries having high education index also exist in the list of top countries on the innovation index, i.e. there is some correlation between the indicators of innovation and education in the countries. Basing only on data of these two indexes it is impossible to talk on any definite cause-effect relations. For example, Nassim Taleb stated that not education influences on

the development of economy, but developed economy increases the number of educated people in a country [6]. In spite of this, the education today captures the most part of young people in the developed countries in this or that form – not only in the form of systematized process of data convey, but via cultural activities and interactions, via convey of definite values focused on knowledge as value itself. In addition, the education is an inherent part of scientific personnel forming.

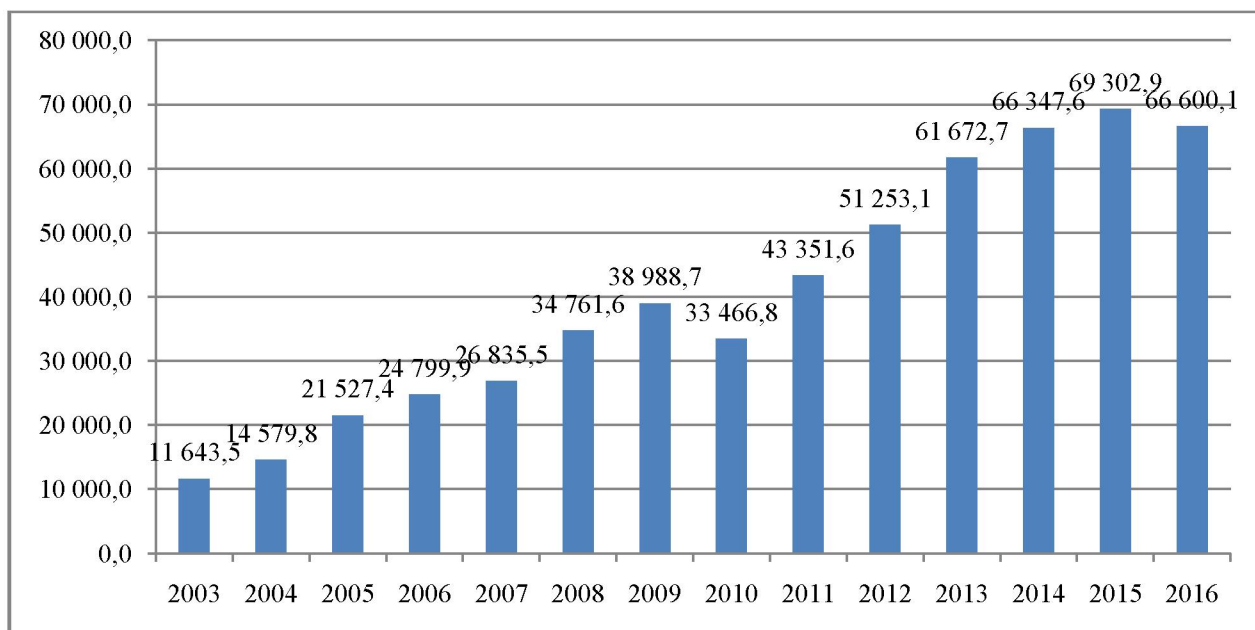
According to a definition, science is a field of human activity which function is elaboration and theoretical systematization of knowledge on reality; includes activities on new knowledge acquisition and its result – the sum of knowledge forming a base of scientific worldview [7].

Basing on the definition of the innovative economy stated above, the interconnection of science and innovative economy development is direct – a science, field of activity systematizing and elaborating new knowledge is one of the main sources of the innovative economy development. And the science not only generates theoretical knowledge, but elaborates and adopts new methods of practical work that further are transformed by entrepreneurs into innovations on which the innovative economy is based.

If we consider the interaction of education and science in the system of innovative economy, then it can be expressed as follows: Education-Science-Entrepreneurship-Manufacture of product or service. The education stage provides the main knowledge and skills necessary for further functioning in the innovative economy; the science stage generates new knowledge and concepts that are transformed into innovations at the entrepreneurship stage and are adopted by manufacture and make profit in future.

At the same time, the combinations of education and science are possible including the institutional level – in the form of research universities combining the features of educational organizations and scientific-research structures.

Regardless of influence of education and science, the conduction of researches and adoption of innovations need funding that could encourage manufacture of products for its further payback and generation of profit. For the analysis of this expenditures, we use an indicator “Internal expenditures on research and development” shown in Figure 3.



Note – basing on reference [8]

Figure 3 – Internal expenditures on research and developments in the Republic of Kazakhstan, million tenge

Despite significant increase of expenditures in comparison with 2003, this is still insufficient for adoption of innovations. The cost of modern equipment necessary for advanced researches is much higher than opportunities of Kazakhstan investors for today.

In addition, the problem caused by insufficient funding, in particular, salary size of researchers is much smaller than that of foreign organizations. As scientific qualification, owing to globalization, is relatively the same, this causes significant outflow of human capital from the countries in search of a better life.

Conclusion

According to the modern paradigm of development and modernization of Kazakhstan economy proposed by the President in his Address to Kazakhstan nation “Build the future together” one of the tasks is to strengthen the elements of innovative economy in the structure of the national economy. The innovative economy requires, first of all, high speed of operation with knowledge and information, and to be at the cutting edge of research and innovative works. The education, as one of the factors, encouraging the human capital development, i.e. personnel able not only to implement ordinary actions, but continuously develop own talents and skills of operation with knowledge to acquire and transform this knowledge into innovations, today is one of the inherent parts of the innovative economy. In its turn, the science is an element creating a medium in which the knowledge manipulation process occurs to form new knowledge and concepts that further will be used by economically active agents of the innovative economy to create innovations and get practical effect from the results of scientific field operation. Science and education, in its turn, are also interconnected and able for close interaction, for instance, at specialized organizations, such as research universities ensuring seamless transition from skills acquisition to its direct application. In addition, the contemporary education system should be more focused on the development of skills of thinking and self-development than on conveying of fixed knowledge as the latter can suddenly become out of date. Under this context, the value of such abstract theoretical knowledge as mathematics and information science increases.

REFERENCES

- [1] Tolkovyy slovar Ushakova onlayn. URL: <http://ushakovdictionary.ru> (in Russ).
- [2] Innovatsionnaya ekonomika. URL: <https://dic.academic.ru/dic.nsf/ruwiki/450233> (in Russ).
- [3] Panzabekova A.Zh., Mussayeva D.M., Zhanbozova A.B. Formation and development of information society in the context of its impact on quality of population life. Reports of the National Academy of Sciences of the Republic of Kazakhstan. 2018. Vol. 5. Number 321. R. 94-99. <https://doi.org/10.32014/2018.2518-1483.14> (in Engl)
- [4] Reyting stran miro po urovnyu obrazovaniya. Informatsiya ob issledovanii i ego rezultaty. URL: <http://gtmarket.ru/ratings/education-index/education-index-info> (in Russ).
- [5] Globalnyy indeks innovatsiy. Informatsiya ob issledovanii i ego rezultaty. URL: <http://gtmarket.ru/ratings/global-innovation-index/info> (in Russ).
- [6] Nassim Nikolas Taleb. Antihrupkost. Kak izvlech vyigodu iz haosa. 2015. Kolibri. C. 770. ISBN 978-5-389-09892-3 (in Russ).
- [7] Nauka. URL: <https://dic.academic.ru/dic.nsf/enc1p/32282> (in Russ).
- [8] Komitet po statistike Ministerstva natsionalnoy ekonomiki Respubliki Kazahstan. Ekspress-informatsiya «Vnutrennie zatraty na NIOKR po oblastyam». Astana. 2017 (in Russ).

А.Х. Галиева¹, Ж.Н. Саду¹, М.Т. Кулубеков², Л.А. Казбекова³

¹Қазақ экономика, қаржы және халықаралық сауда университеті;

²М. Дулатов атындағы Қостанай инженерлік- экономикалық университеті;

³Қорқыт Ата атындағы Қызылорда мемлекеттік университеті

БІЛІМ ЖӘНЕ ҒЫЛЫМ ИННОВАЦИЯЛЫҚ ЭКОНОМИКАНЫ ДАМУ ФАКТОРЫ РЕТІНДЕ

Аннотация. Жұмыстың мақсаты білім мен ғылымның рөліне инновациялық экономиканы қалыптастырудағы құрылымдық элементтер жиынтығы ретінде талдау жасау болып табылады. Міндеттер ретінде мыналар қойылды: білім мен ғылым ұғымын ашып көрсетіп, олардың құрамдас бөліктері мен инновациялық экономиканың өндіріс процесіндегі орнына, олардың өзара байланысына құрылымдық негіздік элементтер ретінде талдау жасау. Жұмыста келесі әдістер пайдаланылды: графикалық талдау, дедукция және индукция әдістері, семантикалық көздерді талдау. Зерттеу барысында білім деңгейі мен экономиканың инновациялық даму деңгейі арасындағы белгілі бір корреляция туралы мәліметтер алынды және білім экономикасындағы айқындалған мақсаттарға сүйене отырып, нарықтық экономика тұрғысынан білім саласындағы әлеуметтік сұраныс ерекшеліктері анықталды.

Нәтижелер білім мен ғылым менеджменті саласында мемлекеттік саясатты оңтайландыру үшін қолданылуы мүмкін. Мақала соңында табысты инновациялық экономика қалыптастыру үшін білім арқылы жұмыс дағдыларын оқытуға практикалық білімді барынша төмен икемді бере отырып көшу қажет деген қорытындыға келеді.

Түйін сөздер: инновациялық экономика, зерттеу институттары, адам капиталы, үздіксіз білім беру

А.Х. Галиева¹, Ж.Н. Саду¹, М.Т. Кулубеков², Л.А. Казбекова³

¹Казахский университет экономики финансов и международной торговли;

²Костанайский инженерно-экономический университет им. М. Дулатова;

³Кызылординский государственный университет имени Коркыт Ата

ОБРАЗОВАНИЕ И НАУКА КАК ФАКТОРЫ РАЗВИТИЯ ИННОВАЦИОННОЙ ЭКОНОМИКИ

Аннотация. Целью данной работы является анализ роли образования и науки как совокупностей структурных элементов в формировании инновационной экономики. В качестве задач были поставлены: раскрыть понятие образования и науки, проанализировать их составляющие и их место в производственном процессе инновационной экономики, проанализировать их взаимосвязь как структурных системообразующих элементов. В работе были использованы следующие методы: графический анализ, методы дедукции и индукции, анализ семантических источников. В ходе исследования были получены данные об определенной корреляции между уровнем образования и степенью инновационного развития экономики, раскрыты особенности социального запроса в сфере образования с точки зрения рыночной экономики, исходя из которых определены цели образования в экономике знаний. Результаты могут быть использованы для корректировки государственной политики в сфере менеджмента образования и науки. В конце статьи авторы пришли к выводу, что для успешного формирования инновационной экономики необходим переход с менее гибкой передачи практических знаний к обучению навыкам работы со знаниями.

Ключевые слова: инновационная экономика, исследовательские университеты, человеческий капитал, непрерывное образование

Information about authors:

Galieva A.H. - Kazakh University of Economics, Finance and international trade, associate Professor, Department of Economics alma_galiyeva@mail.ru;

Sadu Zh. N. - Kazakh University of Economics, Finance and international trade, associate Professor of "Economics";

Kulabekov M. T. - Kostanay engineering-economic University. M. Dulatov, Dean, faculty of Economics, kmaksat_79@mail.ru;

Kazbekova L. A. - Korkyt ATA Kyzylorda state University, head of Department. Department of Economics and management».